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OVER-THE-HORIZON AMPHIBIOUS BATTLESPACE SITUATIONAL AWARENESS

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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An over-the-horizon operation is the only prudent technique to carry out amphibious warfare in a modern threat environment. In order to operate over-the-horizon, traditional amphibious command and conrol must be abandoned, and a new paradigm created and accepted by the amphibious leadership. The Department of the Navy's new maritime philosophy, "...From the Sea", dictates the change. A concept of gathering, manipulating and disseminating tactical information will be described which makes Navy and Marine commanders more effective in their battlespace and better members or leaders of a joint task force. The scope is conceptual with only enough detail to show linkage. Systems are described in order to show their relevance and that they currently exist. Smaller Marine forces are the focus, but the principles are applicable to large scale operations including joint. The paper demonstrates that without a new paradigm of command and control over-the-horizon operations cannot be conducted, and without an over-the-horizon capability, amphibious warfare is not relevant.

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Abstract of
OVER-THE-HORIZON AMPHIBIOUS BATTLESPACE
SITUATIONAL AWARENESS

An over-the-horizon operation is the only prudent technique to carry out amphibious warfare in a modern threat environment. In order to operate over-the-horizon, traditional amphibious command and control must be abandoned, and a new paradigm created and accepted by the amphibious leadership. The Department of the Navy's new maritime philosophy, "...From the Sea", dictates the change. A concept of gathering, manipulating and disseminating tactical information will be described which makes Navy and Marine commanders more effective in their battlespace and better members or leaders of a joint task force. The scope is conceptual with only enough detail to show linkage. Systems are described in order to show their relevance and that they currently exist. Smaller Marine forces are the focus, but the principles are applicable to large scale operations including joint. The paper demonstrates that without a new paradigm of command and control over-the-horizon operations cannot be conducted, and without an over-the-horizon capability, amphibious warfare is not relevant. The concept fits the joint arena and creates an environment for naval commanders to command the joint task force. The conclusions are that the pieces for a new paradigm exist and can be incrementally introduced now. However, the amphibious leadership must change perspective and demand situational awareness and not just information.

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CHAPTER I

INTRODUCTION

The battlespace around an expeditionary force conducting amphibious operations is becoming more and more complex. Over-the-horizon amphibious operations, large battlespace areas, diverse forces, and compressed decision making time, have generated a need for a new paradigm of command, control, and surveillance for the amphibious commanders.

Currently a plethora of command, control, communications, computer, and intelligence (C4I) systems are becoming available to the Commander Amphibious Task Force (CATF) and the Commander Landing Force (CLF). Although initial development of these system was service orientated, a family of devices could be used mutually and the data they generate "shared" during amphibious operations.

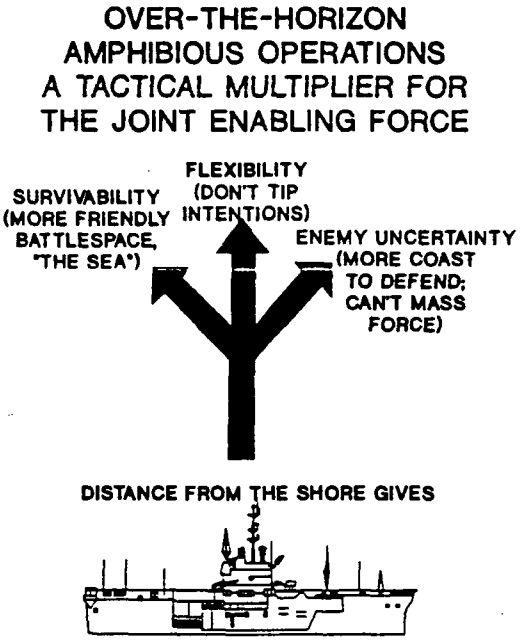
This "family" of systems is not integrated. Not all Navy shipboard systems are "talking" computer to computer, let alone Navy computer to Marine computer. Much of the USMC C4I equipment is reserved for large scale Marine Expeditionary Force (MEF) level operations, where command shifts and remains ashore. Few emerging USMC C4I systems are aimed at or made available to the more likely, "...from the sea" forces, the Marine Expeditionary Unit and Brigade (MEU/MEB). In addition, the current systems are

so diverse and evolving so rapidly that the users, the warriors, are not conversant with the capabilities these force multipliers bring to the battle. The systems are left to "data dinks" and for the most part only thought of as "communications" networks, rather than a potential **battlespace situational awareness** tool.

The purpose of this paper is: (1) to highlight the **need** for such a paradigm using "...From The Sea" as a mission need statement; (2) to conceptually develop this "new paradigm" system using existing subsystems, current technology, and developing C4I systems; (3) describe, explain, and justify the tactical and operational relevance of an integrated battlespace situational system to the commander; (4) explain how the development and integration of these "expeditionary" systems support the Joint Task Force (JTF), and their presence on large deck amphibious flag ships would facilitate that platform in hosting the Commander of the Joint Task Force (CJTF).

CHAPTER II

FURTHER "...FROM THE SEA",
OVER-THE-HORIZON AMPHIBIOUS ASSAULT



Amphibious warfare is "the most difficult of military operations, to succeed it had to build up combat power from zero on a hostile shore, fortified by determined defenders..."[1] Many in the Navy and other services have questioned the rationale and feasibility of this "difficult" type of warfare, especially with the advent of sophisticated over-the-horizon weapons such as cruise missiles and mines. However, the Marine Corps has "....insisted that even in a world of long-range missiles, the United States needed the ability to force its way ashore across a defended beach to protect its vital interest."[2] The resurgence of expeditionary warfare, and its major place in the current Department of the Navy lexicon is testimony to the statement that

amphibious warfare wasn't outdated. The way we do it just needed to be changed.

The concepts of maneuver warfare were mixed with technology and applied to the amphibious art. The landing craft air cushion (LCAC), a military hovercraft capable of 45 plus knots over water and reduced speeds over land, could carry 60 tons of Marine equipment ashore very rapidly. LCACs, combined with helicopter vertical envelopment (spearheaded by the long range CH-53E), vertical/short takeoff and landing (VSTOL) tactical aircraft like the AV-8B Harrier for close air support (CAS), the possible introduction of the tilt-rotor V-22 Osprey transport, and the sophisticated ships like the Wasp class (LHD-1) to support these innovations, create a new concept of maneuver from the sea.

> The idea was for an amphibious task force to remain over the horizon at distances up to 50 miles at sea - and instead of launching head-on-attacks against enemy defenses (as done in the Pacific war), attack an enemy's soft spots. Helicopters could by-pass beach defenses by going behind or around them, and attack from the rear or flanks. LCACs, carrying tanks and other heavy equipment and traveling on a cushion of air at speeds of up to 50 knots, would land unexpectedly at undefended, unmined, and unlikely beach sites and link up inland with the helicopter-landed forces.[3]

By increasing the distance from the shore when the assault commences makes amphibious warfare even more difficult than the old under-the-horizon type. The number of participants increase as the size of the battlespace, traditionally called the Amphibious Objective Area (AOA) increases. Timing, a key ingredient in amphibious warfare, is more difficult to manage. Command and control, another achilles heel, becomes even more nightmarish. Then, why not hunker up to the beach as in the past

(under-the-horizon) and "land, the landing force"?

> A flexible landing plan will enable commander, amphibious task force (CATF) and the commander, landing force (CLF) to gain and retain the tactical initiative, enhance operational flexibility, take advantage of enemy force dispositions and/or weaknesses, and employ the element of surprise to the maximum extent. This capability is based on the range and speed capabilities inherent in the air cushion landing craft (LCAC) and vertical takeoff and landing (VTOL) platforms which allow a coordinated assault over a wide range of potential landing zones.[4]

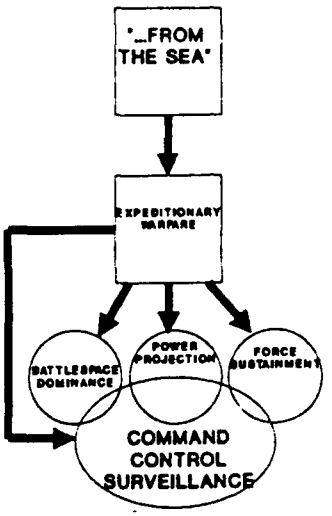
The bottom line is that in today's environment the "enabling" force of amphibious warfare, coming "...from the sea", must do so by acting faster than the enemy can react. This means doing it from over-the-horizon.

> Previously, an amphibious force relied on extensive firepower to suppress and destroy enemy defensive positions while the landing force approached the beach at a speed of only six to eight knots. Clearly, the firepower possessed by even most Third World military forces would make such an amphibious assault extremely risky. For amphibious operations to succeed in the future, the amphibious force must be able to act faster than the enemy can react.[5]

CHAPTER III

HOW DO WE ENABLE THE "ENABLING" FORCE

COMMAND, CONTROL AND SURVEILLANCE KEY TO EXPEDITIONARY WARFARE



The new military strategy for the United States is based upon deterrence, forward presence, enhanced power projection, and the capability to rapidly reconstitute forces. "The Navy and Marine Corps will now respond to crises and can provide the initial, "enabling" capability for joint operations in conflict".[6] Amphibious forces fit well into this strategy. Their flexibility and inherent "expeditionary" nature evidenced by strategic mobility, combined arms and a formidable forcible entry capability places a premium on them, especially during contingency operations.[7]

This new direction of the Navy and Marine Corps of "enabling" through expeditionary warfare requires four key

operational capabilities: command, control, and surveillance; battlespace dominance; power projection; and force sustainment.[8] These capabilities are integral, endemic and nothing new to amphibious (expeditionary) warfare.

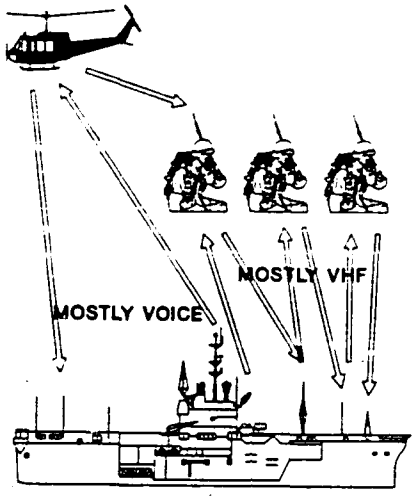
Rather than view these four capabilites as equal and distinct, they are sequenced and interrelated. Power projection does not occur without battlespace dominance; neither battlespace dominance or power project endure long without force sustainment; no cabability exists without a piece of command, control and surveillance or C4I. In fact, each piece of the Navy's new strategy depends on C4I. Forward deployment is tied to satillite communications (SATCOM), Tactical environmental support systems (TESS), tactical support centers (TSC), cryptologic and intelligence (INTEL) centers. Strategic deterrents are tied heavily to special SATCOM. Even force sustainment uses sophisticated "command and control" systems and equipment to manage support forces and supply functions.[9]

A common linkage in these new directions and capabilities is our ability to organize and manage it (commanding and controlling). It is the glue that holds the expeditionary force together - "enabling" the enabling force.

CHAPTER IV

OVER-THE-HORIZON ASSAULT
WITH UNDER-THE-HORIZON C4I

CURRENT AMPHIBIOUS C-SQUARED
(CIRCUIT INTENSIVE, LINE OF SIGHT
AND LOW DA... RATE (VHF - VOICE))



"The biggest improvement in USMC ship to shore amphibious command and control since World War II is; we don't talk in Navajo anymore; we use secure voice." This statement was made by Captain Charles Saffell, Commanding Officer of the USS Wasp to Brigadier General Paul Van Riper, Commanding General of the 2d Marine Division, in the Landing Force Operations Center (LFOC) on board Wasp during a division level command post exercise (CPX) in November of 1992.

The Wasp class is "the" most sophisticated multi-purpose amphibious assault ship in the world. It was specifically designed to support other-the-horizon amphibious operations. The C4I capabilities of the ship are without peer in the amphibious

force, and they rival the aircraft carrier. In LFOC alone, two large screen displays (LSDs) and a host of computer work stations provide interactive Naval Tactical Command System - Afloat (NTCS-A) computer generated color maps, charts, and operational data. Each display is independent of the other, but can share data bases. In addition, another LSD and several work stations are available in the supporting arms coordination center (SACC), another command space in Wasp. In addition, the CATF's flag plot command center displays and the ship's combat information center (CIC) displays are connected to a fiber optics local area network (LAN) with SACC and LFOC, which would allow any center to share any data or picture.[10]

Wasp's high frequency (HF), ultra high frequency (UHF), and UHF satellite equipments (both voice and high speed data) are "state-of-the-art". (In December of 1992, super high frequency (SHF) satellite systems were intalled in Wasp). The very high frequency (VHF) equipment installed in Wasp is not new, but comparable with in use Marine equipment.

With all this equipment standing idly by during the CPX in November, the "Three Map Theory" of command post layout was being exercised with acetate and grease pencil charts for enemy-order-of-battle, operations map, and the fire-support-coordination map[11] over top of the computer LSDs. Staff officers were maintaining multiple radio voice circuits with the shore using mainly VHF (at a very low data rate). They did use secure voice and not Navajo. (Note - the basic position, location, reporting

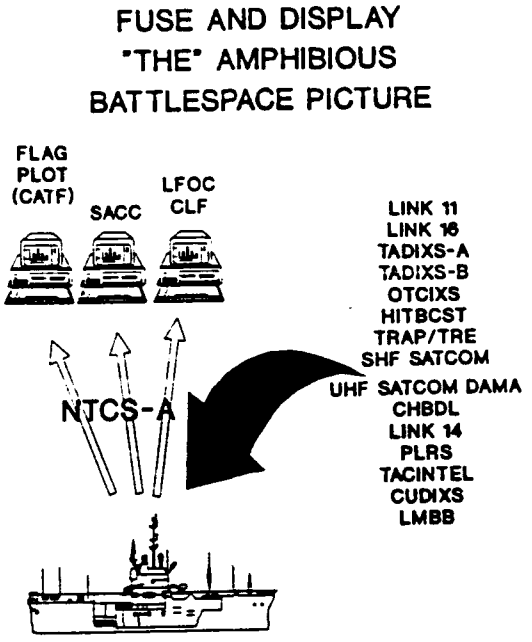
system [PLRS]; a system that uses transponders to display location of specific units {helicopters, craft, vehicles, or personnel}[12] was exercised.)

This scene was not new. MEU operations during Wasp's, first of the class, deployment saw similar command and control arrangements. This is in no way an indictment of the staffs or the fine Marines and sailors that operated from Wasp. It is rather an indictment of the way we, the operators and commanders, in amphibious warfare think about C4I. We view "it" as a "communications" issue and the communicators' problem. In the above scenario, the staff operators were not schooled in the use of the systems. The commanders were not familiar with their capabilities and potential. NTCS-A had very limited USMC tactical symbol sets in its software; an easy fix if there was a demand for it by the user or commanders. PLRS does not interface with NTCS-A, so this positioning information of forces could not be overlaid onto the LSD situational displays (in work now). Finally, it is difficult to advertise an over-the-horizon capability, when our primary radio circuits are under-the-horizon (line of sight).

Our helicopters, Harriers, LCACs, and C4I subsystems don't make us hunker up close to the beach for the initial assault; it's our attitude and the laws of physics!

CHAPTER V

SQUEEZE THE ENVIRONMENT FOR INFORMATION
THEN MAKE SENSE OUT OF IT



> The warrior needs a fused, real time, true picture of his battle space and the ability to order, respond, and coordinate horizontally and vertically to the degree necessary to prosecute his mission in that battle space.[13]

The alphabet soup of links, circuits, and nets indicated in the figure above and more are currently available or planned to be available to the large deck amphibious flag ships (LHD/LHA). These systems exist today. There is no development time; they are or will provide data, some at high rates, to shipboard computers and systems. This is the information environment.

Data comes in many types; realtime, near realtime, relevant, relevant later, and maybe irrelevant. To be relevant now or later, it must be intelligible to decision makers. To be

successful in the complex world of amphibious operations, the CATF and the CLF **must** maintain an ongoing dialogue and must share **common** data throughout the entire operation. The information and data exchange requirements will change through the different phases of the amphibious operation. But again to be relevant, the information must be made known to the CATF and/or CLF. With the alphabet soup saturation of data, CATF and CLF need display systems, decision aids, and communications managers to help them and their staffs "digest" the information environment and what it is telling them about the amphibious battlespace.

By doctrine (COPERNICUS architecture), Naval Tactical Command System - Afloat (NTCS-A) is the system used by the Navy to "squeeze" the soup of inputs into a comprehensible environment for decision making. NTCS-A is well developed and sophisticated local area networks (LANs) installed on all large deck amphibious flag ships. In addition, even the smallest of amphibious ships are provided at least an austere NTCS-A capability (without all the data flows shown in the above figure).

The Marines have a less robust system called the Marine Corps Tactical Command and Control System (MTACCS). It is modular in development, and several of the components are currently functioning. Unfortunately CATF and CLF are not very familiar with each other's system, and at present the systems are not integrated (however, the USMC intelligence analysis system (IAS) is aboard USS Wasp and integration with NTCS-A is underway[14]).

The need is to pull as much from the information environment as possible (it does not matter whether it was generated by a USN or USMC system) into a "shared" data base and provide "tools" both the CATF and the CLF understand, use, and mutually trust. In addition, the different systems that manipulate the same real event should have the same information about that event. An example is the position of a task force unit. Several systems could have a geographic location for the unit, but they all could be different. There must be a "ground truth" system that is "the" data base for all the data bases. If there isn't "one" answer, that both CATF and CLF concur upon, planning and execution of the assault will suffer.

There are two concepts for integrating the USMC/USN shipboard command and control needs. One is to integrate USMC shipboard requirements within NTCS-A and/or other Navy systems. It is similar to how communications requirements are treated now. Special Marine requirements would be met by USMC developed software that runs as application programs in the NTCS-A environment. The second concept is a "gateway" type of arrangement, where MTACCS hardware and software use translators to "talk" to NTCS-A.[15]

At the small force level, Marine Expeditionary Unit (MEU), the concept of integrating USMC needs into NTCS-A seems the most functional. Space limitations, scope of operations, and the unlikelihood of permanent movement ashore favor using one system with specific applications and shared data. A case could also be

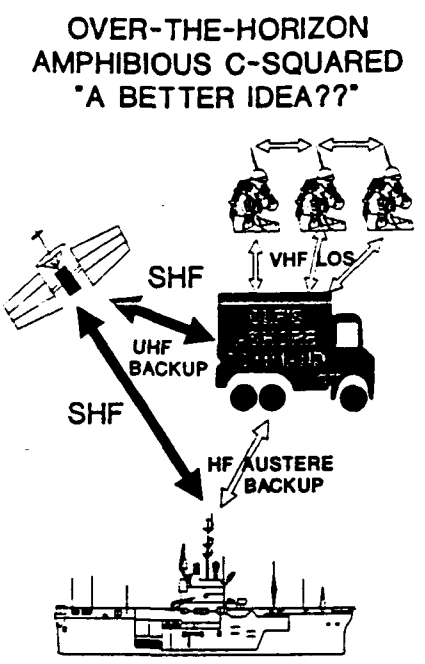
made for this concept with regards to the Marine Expeditionary Brigade (MEB) operations. Marine Expeditionary Force (MEF) level amphibious operations do have a high probability of moving command ashore and would favor MTACCS maintaining a life of its own.

The translators are an initial fact of life, as too much capital is invested in current systems, and as long as NTCS-A is the "shell" and "ground truth" system, the needs of the CATF and CLF at the MEU and MEB levels of operation can be met.

The joint C4I perspective of development is three fold. First the quick fix will require "translators" for service systems to talk to each other in the JTF arena. Next, in the mid-term, systems will be made in modular building blocks; total interoperability for all new C4I systems will be a requirement; and joint wide-area networks will become more common. Finally, in the objective phase, evolving technologies will be identified and assimilated; a common interface environment will exist across the spectrum of information; and a global C4I network of fused information will be used by all components in the joint world.[16]

CHAPTER VI

A BIGGER AND LONGER COMMUNICATIONS PIPE ...FROM THE SEA



A commander should command from well forward.[17]

As the amphibious task force (ATF) transits towards its objective area, the Navy and Marine teams lead by the CATF and CLF are planning and tuning tactics for the upcoming assault. As discussed in the previous chapter, vast amounts of data, mostly non-realtime, about the perspective battlespace have and are being generated by on board and off board systems. The data bases of the command and control systems are filling and providing information to the display mediums and "the" ground truth data base. In addition decisions aids imbedded in the display systems allow, the commanders to analyze different own courses of action (OCA) against a host of enemy capabilities

(EC).

At H and L hour, it is time to "land, the landing force" and to land them from 50 miles at sea for the first wave and remain over-the-horizon until further notice. Previously non-realtime battlespace information is being updated by more realtime systems like tactical data links from remote sensors, radar, PLRS, ELINT, etc. The initial wave moves toward the beach using silent procedures or monitored by temporary communications links relayed through aircraft or via HF circuits. The CATF maintains connectivity with the other major amphibious units via UHF SATCOM voice and data systems; at the same time "sharing" the battlespace picture with the supporting CVBG via SHF or UHF SATCOM.

In the first LCAC to reach the beach is the command element (CE) vehicle with the 800 pound LST-8000 lightweight satellite terminal[18] installed in addition to its normal complement of VHF tactical radios. A secondary command vehicle follows with a portable, mobile UHF SATCOM system and proceeds to its alternate command post site.

CATF and CLF onboard the LHD/LHA are now relying more and more on realtime sensors and their associated systems to provide status of the battle for tactical maneuver decisions. However, other systems (realtime and non-realtime) will continue to provide inputs as to future actions, status and disposition of supporting and supported forces, intentions of the commander, joint task force (CJTF), and continued inputs on enemy

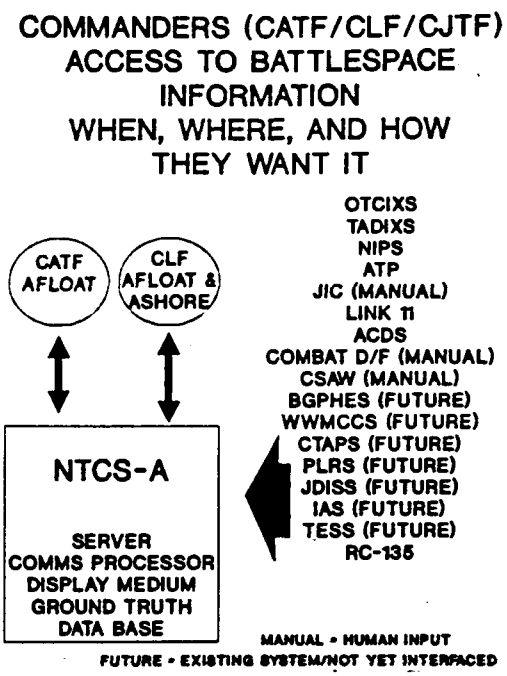
capabilities (ECs).

Within minutes of the CE vehicle's arrival at its designated site[19], the (high data rate {up to 256 Kbps}, large volume, secure, jam resistance[20]) SHF link is established with the ship. Now a robust data and information "pipe" connects the sea based forces to the shore. The collated and fused tactical picture the CLF is viewing in LFOC is available to the shore, as is imagery, multiple voice and data channels for executing the power build up ashore, as well as several other subsets of information. In addition, data from operating units can be received at the CE vehicle (VHF) and relayed or entered into the data base for transmission back to the LFOC or SACC. When the primary CE vehicle comes on line the secondary UHF SATCOM vehicle, which had been maintaining a continuous and mobile over-the-horizon link with the ship during the initial maneuver ashore, becomes the back up platform.

CLF takes a final look at his large screen display (LSD) in LFOC and boards his helicopter "to command well forward". He knows when he arrives ashore he will have a similar "picture" waiting for him at his command post. The difference being the tactical and operational changes that occurred during his transit will be updated and displayed. Also the trip will take a little longer because the ATF is located **over-the-horizon**.

CHAPTER VII

YOU CAN HAVE IT YOUR WAY IF YOU KNOW WHAT YOU WANT



> ...give the battlefield commander access to all information needed to win the war and provide the information when, where, and how the commander wants it. General Colin Powell[21]

The amphibious scenario described in chapter 6 was not a futuristic look at capabilities coming to the force in the out years. Each of the links and communications paths displayed and described in chapter 5 exist today and are deployed with fleet and amphibious forces now. NTCS-A has the capability to perform the data base management, display, and communications processor functions described in the last chapter. NTCS-A decision aids are currently focused on the naval component of power projection and battlespace dominance, but quick software changes can be

generated to provide the Marines with aids suited to their needs. The LST-8000 exists, and it weights 850 pounds and can be assembled in 45 minutes.

Why haven't we tried something similar to what was described in the last chapter during an exercise? The answer is the commanders didn't want it. Or it might be more correct to say they didn't know they wanted it. Engineers and other "data dinks" can drive the when, where, what, and how of information processing, handling, display, and decision assistance, but that is the wrong approach. Copernicus and C4I for the Warrior (C4IFTW) recognize and stress that information is not very useful unless it is "the" information the commander needs to prosecute the mission in his battlespace. Commanders must participate in setting the standards for the systems that serve them. They must understand what the alphabet soup of acronyms can do for them, so they know "...how the commander wants it."[22]

General Powell talked about "all information needed...". In today's world of data proliferation there is a lot of information available to the commander. Tomorrow there will be a geometric increase. Machines must help "make sense" of the information environment, especially in a time compressed and vital decision process like war. In the maritime environment, there is not time or space (on ships) to have the legion of human operators to receive, catalogue, analyze, and display each piece of important or "would be" important data. Machines must talk to machines at very high exchange rates. There must be a core architecture or

system that takes the lead and pulls the functional systems into a frame of reference for the commander. In the Navy, Copernicus architecture, embodied in NTCS-A, gives us the system to function as that shell. It operates as a server for the onboard functional systems bringing different types of data and information to and from the decision maker. Functioning as a communications processor, NTCS-A can pull in and "make sense" of external information sent to or from the commander. It also acts as a single, ground truth data base. Other subsystems can come to NTCS-A for information on an issue, and if they generate more information or more accurate information on that issue then the NTCS-A data base is updated. In addition, NTCS-A is a excellent display and display manipulation system which is currently prevalent on all ships.

To give a flavor of how NTCS-A can tie together the diverse operational needs of the CATF and CLF, let's conceptualize how a few of the systems, annotated in the above figure, provide a positive piece of information, command, or control for amphibious operations.

OTCIXS (a UHF SATCOM, medium data rate link used normally for ship to ship data exchange - machine read by NTCS-A).

ASW - the supporting ASW commander could provide CATF a near-realtime picture of the submarine threat and ASW prosecution in his battlespace.

ASUW - again the supporting ASUW commander could provide CATF with threat warning, danger areas and arcs

to avoid, and a status of the ASUW operations as they effect him.

NGFS - Assets from the CVBG (cruisers, destroyers, and/or frigates) are often called into the amphibious battlespace to provide naval gun fire support (NGFS) of operations ashore. A fire support area (FSA) could be sent via a computer overlay to the joining ship to expedite his arrival into the proper area. In addition, CLF could hook (designate) a point on his display unit in his ashore command post that would be transmitted, computer to computer, to SACC on the LHD/LHA. That coordinate could be sent via OTCIXS to the gun ship and fire called in rapidly without voice communications.

TADIXS (same data rate as above, but primary focus is shore to ship information transfer, normally one way). Scenario building and crisis action planning are enhanced by rapid access to shore intelligence systems.

NIPS (automated intelligence data base, interfaced directly into NTCS-A - updates a contact as to order of battle (OOB) information.

ACDS (advanced combat direction system for the LHD - interfaced automatically into NTCS-A - provides realtime (radar) or very near-realtime (link 11) data on the environment around the LHD, including inputs from remote sensors).

ADZC (amphibious defense zone coordinator) ACDS useful

in providing information to the CATF and CLF on the AAW picture as it is prosecuted by supporting or ATF forces.

ADGE (air defense ground environment) integration is aided by ACDS and the data could be transferred and displayed for the CLF ashore in order provide warning of air attack either coming from the sea or the land mass.

WWMCCS (currently received on the LHD/LHA, but not interfaced automatically into NTCS-A) used for joint awareness and planning.

CTAPS (currently onboard the LHD/LHA, but not interfaced automatically into NTCS-A) used to on line manage, display, and control the air tasking order (ATO). Once interfaced and transmitted ashore, CLF could call for sorties from his CE terminal.

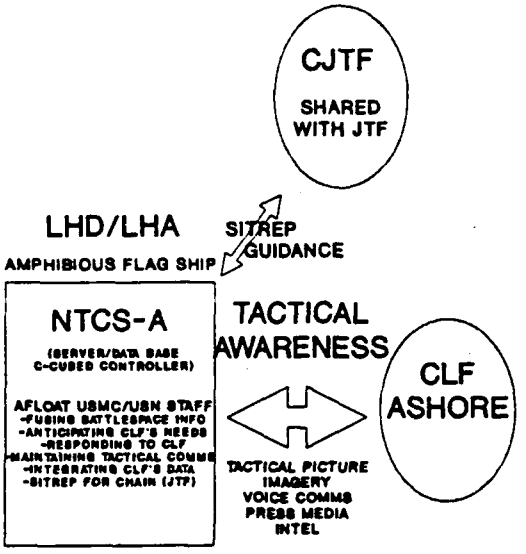
PLRS (currently onboard the LHD, but not interfaced automatically to NTCS-A, but the interface is in work) is a system that provides location of key amphibious aircraft, vehicles, or personnel. It uses transponders through a series of base stations to display the locations in realtime. The upgraded system KSQ-1 will use GPS to do away with the cumbersome cross fixing stations and provide very accurate locations.[23] Once displayed in NTCS-A, the CATF and CLF will be able to overlay and display the maneuver from the sea to and onto the land in realtime.

Not one of these acronyms was created in this paper. They all represent existing systems. Some of those systems are more robust and integrated than others. Most are currently installed onboard USS Wasp and other LHAs. Their integration into the architecture is complete, underway, or contemplated. The names of these systems are relatively unimportant; what is important is that they exist and can help decision makers make the most important decisions - right ones in combat! But to grow and meet the commanders' needs and do it the way he wants it, commanders must be part of the command and control system, not merely a user. These systems are too important to leave to the staff intelligence, operations, or communications officer.

CHAPTER VIII

IT TAKES MORE THAN INFORMATION TO WIN
IT TAKES SITUATIONAL AWARENESS

OTH AMPHIBIOUS BATTLESPACE
SITUATIONAL AWARENESS



On the LHD/LHA a team of USMC and USN staff and ship's company personnel will be laboring to generate a very accurate and complete data base full of information about the battlespace and everything that could enter it. From that data base, the CATF staff will call up, manipulate and display for decision making portions of the data base that are applicable to their function in the operation. In LFOC, SACC, and TACLOG (tactical logistics space), the CLF's staff will be fusing a "picture" that supports the functions and specifics of their mission. Different displays will have different information and the information will be updating as new data is presented to the main data base. The commanders can build virtually any type of display they want, or

they could monitor several displays at the same time. But the same process will be occurring for both CATF and CLF staff. They, with help from the flagship, will be fusing bits of battlespace information into a picture which will describe the tactical situation for a period of time. The period of time can be very short once forces are maneuvering in combat.

The staffs are anticipating their commanders' needs and responding with inputs to the situational display that the decision maker has focused upon. At the same time, the staff is maintaining the tactical communications necessary to direct and mutually support the engaged or about to be engaged portions of the force. At the same time, they are responding to queries from higher authority and adjusting to inputs from the chain of command.

The physical plant of the LHD, and to a lessor extent the LHA, is very supportive of accomplishing these functions. Once the CLF goes to the field, the environment is not as conducive to the sophisticated staff functions being performed aboard ship. So, rather than take these functions ashore, why not just "beam" their outputs there. As indicated in chapter 6, the capabilities exist to do that and more. Maybe instead of the "Three Map Theory" (enemy-order-of battle map, fire-support-coordination map, and the operations map)[24], the command center would have a single interactive computer screen with the amphibious battlespace situational picture on it. The picture would be changing as the situation changed. Operators throughout the ATF

would be contributing to the picture, and the CLF's staff in LFOC would be fusing it for CLF based on preset priorities. Rather than a separate enemy-order-of-battle map, the situational picture would display the known positions as close to realtime as possible in one color and suspected positions in another. Overlaid on the screen would be own force positions provided in realtime by systems like the KSQ-1 (improved PLRS). Intelligence "news flashes" would come up on the screen as an alert sent by the S-2 from JIC. Fire-support-coordination would be overlaid on the situational screen. If it became too cluttered, a touch of a button would re-size it, move it or emphasize it. The touch of a light pen on the screen could translate to a call for fire from a ship waiting in its fire support area (FSA). Another keyboard action would bring in a display of the joint air tasking order (ATO) and another stroke could communicate a request to the JFACC. Pop up alerts (flashing or in some way calling special attention to themselves) generated by the system and passed on through by the shipboard staff would show potential enemy air attacks, unexpected movements, and joint and/or combined operational actions with the potential to impact on the amphibious battlespace.

It would not be a one way street. Tactical information, both VHF voice and digital (manpack DCTs {digital communications terminals}) would be flowing back to the CE ashore and through it to the ship via the SHF pipe. In addition, information would flow directly back to the ship (PLRS positions, data using its

"chatter mode", and via UHF SATCOM), updating "the" data base. Situation reports up the chain of command could be snap shots of the commander's perception of the battlespace as crafted on his situational awareness screen.

What would be in the "pipe" going to and from the ship? As indicated above, the tactical picture would be a major portion. The CLF could request imagery and have it sent digitally to him. Of course voice circuits would flow through the pipe. Intelligence would also be moved as an integrated part of the situational picture or separately depending on the desires of the CLF. In addition, an important capability of the system would be to move press information very rapidly in support of the media's needs.

Besides being "gee whiz" and high tech, this concept gives the decision maker humanly discernable situational awareness, a view of alternative courses of actions, and a little more of the most precious commodity in combat, decision making time.

> Our philosophy of command must also exploit the human ability to communicate implicitly. We believe that implicit communication - to communicate through mutual understanding, ...based on a shared philosophy and shared experience.[25]

When presenting a situation report or request for assets to the CJTF, what better way to insure he understands your plight than presenting him with your situational picture. He, in turn, can provide you with a large scale view of his battlespace as an adjunct to your operations or in explanation of a tactical policy or guidance.

> The Navy and Marine Corps will continue to structure command and control capabilities to promote efficient joint and combined operations as part of an overarching command, control, and communications architecture that can adapt from sea to shore.[26]

The concept presented in this paper conceptually captures and embraces the tenets of the Department of the Navy's direction. The flexibility, robustness, and connectivity afforded the amphibious forces by a concept similar to what I have described will directly align them with each facet of joint and combined operations.

> The Naval Force Commander will have the capability to command a joint task force and function as, or host, a Joint Force Commander.[27]

The concept of "Over-the-Horizon Amphibious Battlespace Situational Awareness" will allow rapid integration of the amphibious force as a component of the joint task force and will create an at sea and an ashore deployable (supported from the sea) environment to host the joint force commander. It also gives a sailor or Marine all the tools necessary to command the joint task force, and as such to win in combat!

CHAPTER IX

CONCLUSION
AN END MIGHT BE A BEGINNING

Over-the-horizon operations are the only prudent way to conduct amphibious warfare. Without a new paradigm for command and control, over-the-horizon assaults can not be conducted, and without other-the-horizon capability, amphibious warfare is not relevant to "...From the Sea".

The concept of gathering, manipulating and disseminating tactical information developed in this paper makes Navy and Marine commanders more effective in their new expanded, over-the-horizon battlespace. It also allows them to become better members and leaders of a joint force. However, the concept hinges on the amphibious leadership becoming more involved in setting the rules for the information management, presentation, and manipulation. It also requires them to demand situational awareness and not just information.

The concept developed in this paper is not an "out years" idea. The pieces exist now, and it can begin now and be improved upon incrementally as doctrine and technology change. It's time to stop talking and writing about the year 2000. It's time to change our mind set and take what we have to sea and the field. Let the smart MEU and amphibious squadron captains, lieutenants, staff NCOs and petty officers make it work and give the designers ideas on how to improve.

GLOSSARY OF TERMS, ABBREVIATIONS AND ACRONYMS

AAW	Anti-Air Warfare
AOA	Amphibious Objective Area
ASW	Anti-Submarine Warfare
ASUW	Anti-Surface Warfare
ATP	Advanced Tracking Prototype
BGPHES	Battle Group Passive Horizon Extension System
C4I	Command, Control, Communications, Computers & Intelligence
C4IFTW	Command, Control, Communications, Computer & Intelligence for the Warrior
CATF	Commander, Amphibious Task Force
CHBDL	Common High Bandwidth Data Link
CJTF	Commander, Joint Task Force
CLF	Commander, Landing Force
COPERNICUS	USN C4I Architecture
CSAW	Cryptological Support to Amphibious Warfare
CTAPS	Contingency TACS Automated Planning System (USAF)
CUDIXS	Common User Digital Information Exchange Subsystem
CVBG	Carrier Battle Group
DAMA	Demand Assigned Multiple Access
ELINT	Electronic Intelligence
GPS	Global Positioning System
HF	High Frequency
IAS	Intelligence Analysis System
JCS	Joint Chiefs of Staff
JDISS	Joint Deployable Intelligence Support System
JFACC	Joint Force Air Component Commander
JIC	Joint Intelligence Center
JOTS	Joint Operational Tactical System
JTIDS	Joint Tactical Information Distribution System
LAN	Local Area Network
LCAC	Landing Craft Air Cushion
LFOC	Landing Force Operations Center
LINK 11	HF/UHF Digital Data Link (TADIL A)
LINK 14	Data Link from NTDS to Non-NTDS Units (TTY)
LINK 16	JTIDS Data Link
LHA	Amphibious Assault Ship, General Purpose
LHD	Amphibious Assault Ship, Multi-purpose
MEB	Marine Expeditionary Brigade

MEF	Marine Expeditionary Force
MEU	Marine Expeditionary Unit
MTACCS	Marine Tactical Command & Control System
NAVSEA	Naval Sea Systems Command
NTCS-A	Navy Tactical Command System - Afloat
OTCIXS	Officer-in-Tactical-Command Information Exchange Subsystem
OTH	Over The Horizon
PLRS	Position Location Reporting System
SACC	Supporting Arms Coordination Center
SATCOM	Satellite Communications
SHF	Super High Frequency
TACINTEL	Tactical Intelligence (SI)
TACLOG	Tactical Logistics
TADIXS	Tactical Data Information Exchange Subsystem
TESS	Tactical Environmental Support System
TRAP	Tactical Receive Equipment And Related Applications
TRE	Tactical Receive Equipment
UHF	Ultra High Frequency
VHF	Very High Frequency
WWMCCS	Worldwide Military Command & Control System

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